Minco

MINCO 820B

Genset Controller Manual

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1. Summarize

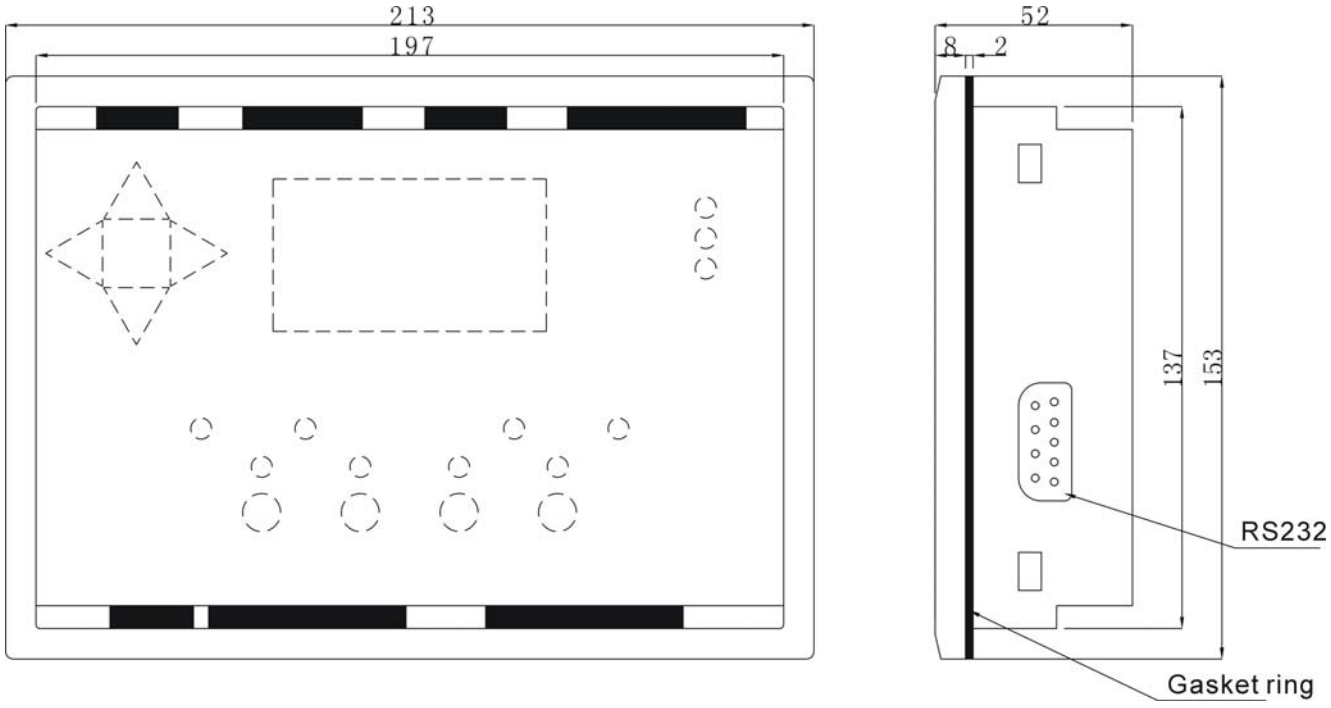
Minco 820B genset controller adopts high performance microprocessor and industry components. It has measuring, controlling, protection, four remote control, flexible software setting functions and high anti-jamming ability. Can display all the measuring parameters, control parameters and genset running state. Actually meets different types of generator auto control requirements . When the mains supply is failure, the control system will automaticly give a start signal to start the genset and resume the power supply in short time; After the mains supply is normal, the control system will unload and shut down automaticly. Adding the monitoring function of mains supply electric quantity, applies to mains supply and genset supply automatic transfer power supply system.

2. Characteristic

1. Double processing chip, real virtual value measuring, action smartly;
2. Mains and genset double power manager, Automatic Transfer Switch system;
3. Wide-screen LCD display with back-light;
4. Chinese and English double language menu, mutual operation, can be set and operated individually;
5. Auto start, Auto protection, ATS control;
6. Perfect auto protection, warning details and working statement character display directly, fault record more than 50 items;
7. Double coolant temp., double oil pressure, fuel level and oil temp. etc connected parameters and so on;
8. All relay contact capability is above 10A/250VAC/30VDC;
9. Electronic speed adjustment and mechanical speed adjustment control compatible, timing start or stop and etc. custom setting; -
10. RS232 communication, attached “four remote control” monitor software;

3. Fixup dimension drawing

Operate panel	W **213** X H **153**mm
Install hole	W **199** X H **139**mm
Deepth	D **52**mm



4. Function define and operate instruction

4.1. Operate panel function instruction

Operate panel is composed of 128X64 LCD display ,operation keys and state indicator light and system menu operate press keys.

(1). System menu operate press keys

Content	Function
ENT	Parameter setting /enter to next menu / confirm to revise
Exit	Exit / back to the superior menu
+	Switch the screen display content, view all the measuring parameters of the genset and the current state; Page up the menu / add value
−	Switch the display content; examine all the genset parameters and the current state. menu page down/degree value

(2). LCD display (Genset runs in normal, not setting state or not fault state)

Operation	Description
Main screen 1 Press + or − can switch the display interface	Normal P 00.0 HZ A :000 V B :000 V C :000 V
Main screen 2 Press + or − can switch the display interface	Generator 00.0 HZ A :000 V 0000 A B :000 V 0000 A C :000 V 0000 A
Main screen 3 Press + or − can switch the display interface	Rotate speed: 0000 RPM Power: 0000.0 KW Power factor: 0.00 Run Time: 00000.0 H
Main screen 4 Press + or − can switch the display interface	Coolant temp.: 010/010 (0) Oil pressure: 999/999 KPa (0) Oil temp.: 010℃ (0) Battery: 25.0 V
Main screen 5 Press + or − can switch the display interface	Stop/OFF status 08-06-03/09:12:15

Attention: If "display change mode" set in "auto" switch state, the LCD display screen will switch to next page after each 10 seconds; if "background light control" set in "auto" state, the LCD screen background light will be auto turn off after three minutes without any operate. Once the fault appear or press any key the background light turns on. If "Background light" control setting as "constant light", the LCD background light will keep lighting.

(3). Operation keys

Content	Function
	Press the key, when the above green LED keep bright, the controller is in "start" state, start the genset in manual and keep running.
	Press the key, when the above yellow LED keep bright, the controller is work in "auto" state, once the "Remote start" switch input turn off and mains get right, the genset will be stopped after delay. When "Remote start" switch input turn on the genset delay start otherwise it's delay cool down; If the genset reset by "remote reset", once the "remote reset" switch input turn off, the controller is in auto state.
	Press the key, when the above red LED keep bright, the controller is work in "stop/reset" state, it will unload, decelerate and idle stop, through idle stop cut off the fuel. During decelerate and idle the "reset" indicator keep flash, keep light after stop.

	Press the key, when the above red LED keep bright, the controller works in “testing” state. Start the generator in manual, when the generator runs in normal, whatever the mains supply is normal or not.The controller will automaticly close, onload and keep running onloading.

(4). State indicator light

Content	Function
	Indicate the genset failure, protected stop, fault content display in the LCD sreen.
	Indicate the genset warning information, alarm detail see screen.
	Indicate “remote start” port state, use in monitor the main state generally.

4.2. Connection port define

Port No.	Function	
	Power supply 8～36V DC, normal working current <300 mA	
1	battery anode input	
2	battery cathode input	
	Analog input（input voltage range 0～5.0V DC）	
3	Analog AGND， inside connect with battery cathode.	
4	Oil temp./fuel level input	
5	Oil pressure input 1	
6	Coolant temp. input 1	
7	Oil pressure input 2	
8	Coolant temp. input 2	
9	User-defined sensor	
Main three phase voltage input (0-300VAC， insulation inside)		
10	Mains voltage phaseR	
11	Mains voltage phase S	
12	Mains voltage phaseT	
13	Mains zero line N	
Three phase load current input（0-5A AC, without inside isolation， must add current transformer）		
14、15	A phase load current	
16、17	B phase load current	
18、19	C phase load current	
Three phase genset voltage input（0-300V AC, voltage transformer with inside isolation）		
20	U phase genset voltage	
21	V phase genset voltage	
22	W phase genset voltage	
23	Zero line N	
Relay output port(Relay insulated, contact capability 10A/250VAC/30VDC)		
24	Emergency supply (Genset supply)	
25		
26	Normal supply (Mains supply)	
27		
	Electronic governor	**Mechanical speed control**
28	Idle NC (normal closed)	Battery negative

29	Idle NO (normal open)	Battery positive
30	Not connected	DC speed adjust motor negative pole
31	Idle common	DC speed adjust motor positive pole
32	Pre-fuel	
33	Common port 2(Pre-fuel and fault common contact port)	
34	Fault	
35	Fuel (stop when ETS)	
36	Common port 1(Fuel and Crank common contact port)	
37	Crank	
Switch input port（add photoelectricity insulation，valid when connect to GND）		
	Electronic governor	**Mechanical speed control**
38	Not connected	DECelerate limited
39	Not connected	ACCelerate limited
40	High oil temp./low fuel level	
41	Low oil pressure	
42	High coolant temp.	
43	Remote reset	
44	Remote start	
45	Emergency stop	
46	Rotate speed signal input	
47	GND, inside connect with battery cathode	

5. Parameter setting

All parameters can be read and write through communication port, details see communication protocol. Except coolant temp., oil press., oil temp./ fuel level sensor option input sensor curve data adjust, all the parameters can be setting by the controller.

Press ENT	**Enter to parameter setting interface** Switch Inputs status　　Alarm limit set Relay Outputs status　　Measure regulate Shutdown Record　　Delay time set Date and time set　　System set
Press + or −	Select the examine /setting parameter content (reversed display when selected)
Press ENT	Enter to the selected menu
Press Exit	Exit the parameter setting state

Attention: If didn't press any keys over three minutes it will auto exit the parameter setting state, to avoid illegimate operation the controller.

5.1. Parameter setting instruction

Switch Inputs status	**Real time display controller input port state** Remote run: 0　　Emergency stop: 0 Remote off: 0　　High coolant temp.: 0 Acceleration limit: 0　　Low oil pressure: 0 Deceleration limit: 0　　High oil temp/Low fuel level.: 0 **Attention:** Press any menu key will be exit
Relay Outputs status	**Real time display controller output port state** Crank: 0　　Fuel: 0 Shutdown : 0　　Pre-fuel: 0 Normal: 1　　Genset: 0 Acceleration: 0　　Deceleration: 0 **Attention:** Press any menu key will be exit

Shutdown Record	**Shutdown record** 01/04 (Fault serial number/ Fault total number) Emergency Stop (Fault reason) 08-06-03/11:26:38 (Fault time) **Attention:** Press [+] , [—], display up and down fault record; Press [ENT] or [Exit] will be exit.
Date and time set	Press [+]、[—] to change the reverse display data; Press [Exit] reverse display move to the left, move to the first position then press [Exit] then back to the superior menu, date and time will not changed; Press [ENT] reverse display move to the right, move to the last position press [ENT] then back to the superior menu, date and time have been changed.
Alarm limit set	**Default setting:** High Voltage: 0250 High oil temp. : 0100 High acceleration: 1550 Low Voltage: 0200 Low battery: 0105 Low deceleration: 0800 High current: 0450 High frequency: 0530 High Coolant temp. : 0096 Low frequency: 0470 Low oil pressure: 0050 High speed: 1650 Press [+] , [—] choose content and the content reversed display; Press [Exit] back to superior menu; Press [ENT], enter choosing parameter setting state, the selected parameter is underline, enter the parameter setting state, press [+] , [—] to change the reversed display data; Press [Exit] move to the end of left, press [Exit] and back to the superior menu, parameter will be not changed; Press [ENT] reversed display move to the end of right, press [ENT] and back to the superior menu, parameter changed and saved.
Measure regulate	**Password: 8421(default password of the factory)** Current A: 0000 Normal A: 0000 Current B: 0000 Normal B: 0000 Current C: 0000 Normal C: 0000 Generator A: 0000 Coolant temp. : ----- Generator B: 0000 Oil pressure: ----- Generator C: 0000 Oil temp./Fuel level: ----- Battery voltage:0120 **Attention:**Coolant temp. ,oil pressure and oil temp./fuel level adjusting value are relevant to the real measuring error. **Password authentication input method** Press [+]、[—] ,Exit when the selected content move to the end press [Exit] and back to the superior menu;Press [ENT] move to the end of right, enter the password press [ENT] then get through the next menu. Users according the error value of the controller measuring data and the real data to decide whether you need to data adjust. The controller already adjusted before leave factory, but it may be some warp in the use environment, if the warp is in the error range, we suggest not adjusting the data, especially the three phases current. If the error over too much and need to adjust, please read the <MINCO 820B Genset controller adjustment instruction>. Press [+]、[—] choose content reversed display, press [Exit] back to superior menu; Press [ENT] enter to choose data adjustment state, and the adjusting parameter underline. Enter to data adjusting state, press [+]、[—] to change the data, press [Exit] cursor turn left, when move to the end, press [Exit] then back to the superior menu, data adjustment in valid; Press [ENT] cursor turn right, move to the fourth position press

	ENT back to the superior menu ,data adjustment achieved, parameter change saved. For three phase voltage, three phase current and battery voltage adjustment, enter data adjust state, change the data then press ENT (Current keep two decimal fraction, battery voltage keep one decimal).Coolant temp.. oil pressure,oil temp.,fuel level option input are different, MINCO820B controller provide coolant temp.adjust, oil pressure adjust,oil temp./fuel level adjust to adjust the measuring data. For the possible error of the coolant temp.,oil pressure, oil temp./fuel level ,MINCO820B provide ±10％ adjusting range。Special explain, for coolant temp. , oil pressure ,oil temp./fuel level sensors maybe positive modulus (it means the sensor output added along with input added), it maybe negative modulus (it means the sensor output minish along with input added), add or minish adjust value lead to adjust effect decide by the real situation.
Delay time set	**Password input: 8421（default）** Cool stop(down): 020 Idle(stop): 015 Transform: 002 Genset start : 005 Acc.time: 020 Over current: 003 Crank INTerval: 015 Low oil pressure: 003 Over voltage: 003 Crank time: 008 High coolant temp.: 005 Over frequency: 003 Bypass time: 025 Over speed: 002 Warm up: 010 ETS fuel: 030 High oil temp./low fuel level : 005 Dec. time: 030 Pre-fuel: 006 Loss speed: 030 Idle (start): 010 Low battery : 020 Press +、— choose content reversed display；Press Exit back to superior menu; Press ENT , enter to choose parameter setting state, the adjusting parameter is underline. Enter the setting state, press +、— to change data, press Exit cursor turn left, move to the end press Exit back to the superior menu, data will not be changed, if press ENT parameter change saved. Delay time up limit can't be over 255 seconds, if setting over 255 seconds system will change to 255 seconds automatically.
System set	**Input password: 8421 (default)** Trip speed: 0400 Speed source: 0 Oil/Fuel select: 1 CT ratio: 0500 Load mode: 0 Phase/Line: 0 Passport: 8421 Coolant source:0 Display mode: 0 Address: 120 Oil pressure source: 003 Language C/E: 1 Crank limit:003 Oil temp. source: 0 LCD mode:1 Gear tooth number:135 Oil temp.action: 0 Opt.2 set: 003 Battery action:1 Press +、—choose content, press Exit back to superior menu, press ENT, enter the setting state, the adjusting parameter is underline. Press +、— change data, press Exit data will not be saved, press ENT can be saved the data, then back to the superior menu.

5.2. System parameter setting

Trip speed	When start the genset, if examine the genset rotate speed >trip speed, it considers the genset start successful and stop the crank output (trip speed generally setting to 1/3 of genset normal working rotate speed)
CT ratio	CT rate setting correspond ratio is 5, for example the current rate setting in 500, it's correspond with 500:5
Passport	Leave factory password 8421， please change the password on your own.
Address	Only use for multi equipment network, to differentiate the equipment.
Crank limit	When Genset starts, if the continuum start failure time over the parameter, it will lead to overcrank fault.

Gear tooth number	Only valid in “rotate speed measuring method” setting in “speed sensor”
Opt.2 set	Setting coolant temp. 2 and oil pressure 2 0: None coolant temp. 2 and oil pressure 2 1:Only have coolant temp. 2 2: Only have oil pressure 2 3: Have coolant temp. 2 and oil pressure 2
Speed source	0 : From Genset power supply frequency 1 : From Speed sensor
Load mode	0 : Keep 1 : Pulse(cut off after closed 2 seconds)
Coolant source	0: Coolant temp. alarm switch 1 : Coolant temp. sensor
Oil pressure source	0 : Oil pressure alarm switch 1 : Oil pressure sensor
Oil temp. source	0 : Oil temp/fuel level alarm switch 1: Oil temp/fuel level input sensor
Oil temp.action	0 : Alarm and stop 1 : Alarm but not stop
Battery action	0 : Alarm and stop， 1 : Alarm but not stop
Oil/Fuel select	Configure with oil temp./fuel level input 0 : Define fuel level， 1 : Define oil temp.
Phase/Line	0 : Measuring phase voltage 1: Measuring line voltage
Display mode	0 : Switch in manual 1 : Auto switch
Language C/E	0 : Chinese 1: English Shortcut method：module power off，press [+]、[—] at the same time and afresh electrify till the language changed.
LCD mode	0 : Auto 1 : Constant light

5.3. Delay time instruction

Delay of “cool stop(down)”	When the controller is in “Auto” state, once the “Remote start” switch input turn off and mains get right, the genset will be stopped after delay.
Delay of “genset start”	When the controller is in “Auto” state, once the “Remote start” switch input turn on or mains failure , the genset will be started after delay.
Delay of “cranking time”	When the genset start and begin to delay,if the start succeed condition is satisfied(genset rotate speed>trip speed) it’s consider to be genset start successful and stop delay.
Delay of “Crank INTerval”	When the cranking time delay ended, if the start succeed condition is not satisfied and not reach the crank times limit, the delay will be repeated and crank times added 1.
Delay of “bypass time”	After the gen-set start successfully, that begin to start delay of the bypass. The term of delay, not monitor "low oil pressure", "high coolant temperature " etc, to avoid mistake alarm when gen-set in start early.
Delay of “ETS fuel”	ETS setting in “0”, controller work as Energize to run (ETR),the fuel supply will have output until stop; “ETS fuel” delay setting in is not in “0”, the controller work as energize to stop (ETS), the fuel supply act as stop. The fuel supply relay also have output when the delay start, the fuel supply relay stop output when delay ended and the oil pressure be lowed.
Delay of “pre-fuel”	Before the gen-set to start, that begin the delay of pre-fuel. At the same time, the relay of “pre-fuel” to closed. After the delay be over, the relay of pre-fuel to open, the gen-set start to crank.
Delay of “idle (start) ”	After the gen-set start successfully, the delay of idle (start) is begin, in the term of delay, the relay of “idle ” begin to work.
Delay of “idle (stop)”	When stopping machine, the delay of idle (stop) is begin. In the term for delay, the relay of “idle ” begin to work.

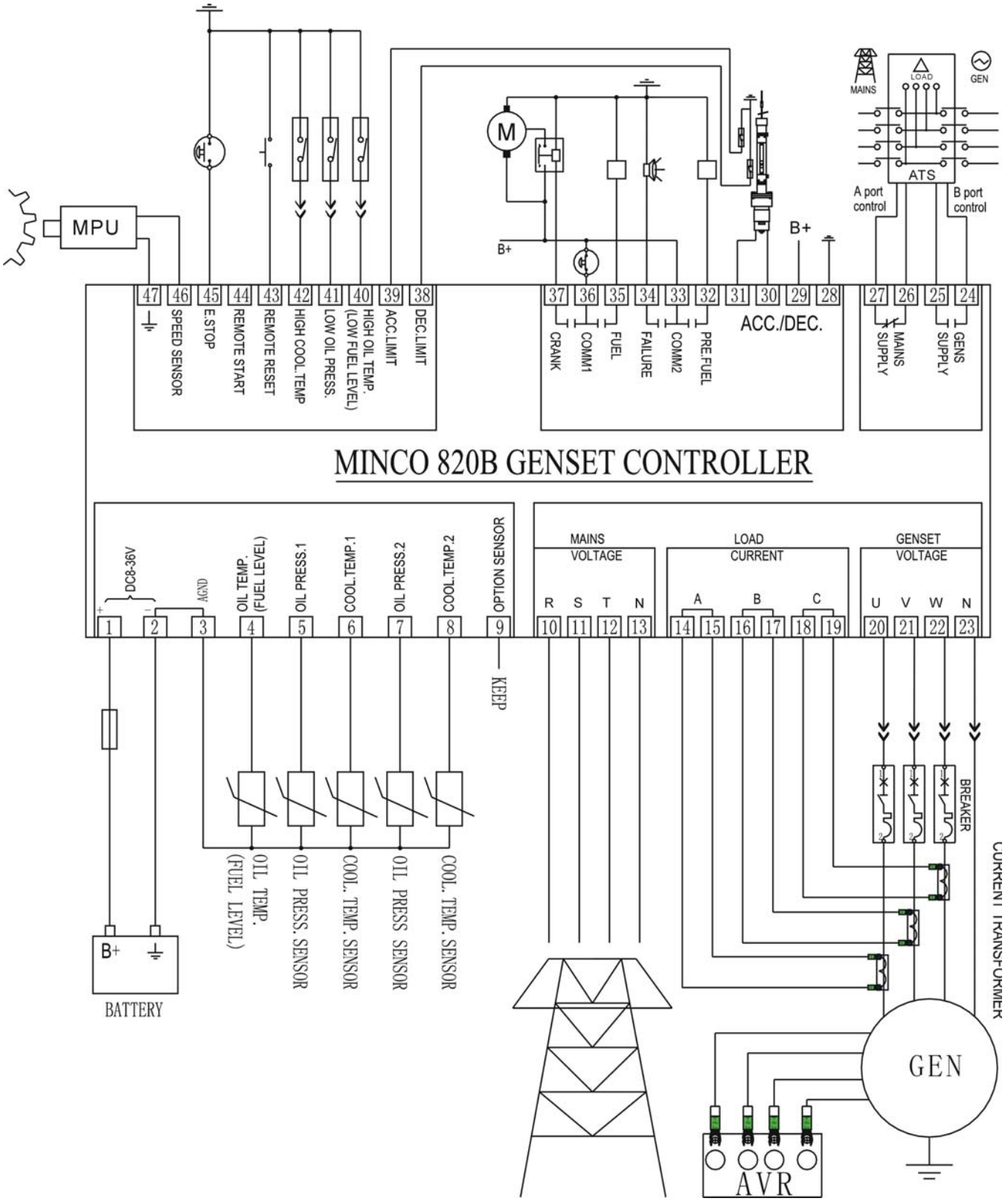
Delay of "ACC"	Genset start successful and idle (start) over, it's beginning ACC delay, ACC relay closed, if the delay ended but still not get the ACC in the right position signal, it will be a "ACC failure" alarm.
Delay of "low oil pressure "	When genset running, if the pressure of oil is over low, the delay is begin. In the term of delay, if the oil pressure comeback normal state, the delay will be interrupt. After the delay is over, if the oil pressure is over low yet, that will appear the alarm of "low oil pressure".
Delay of "high coolant temp."	It is similar to the delay of "low oil pressure alarm".
Delay of "over speed"	Start when the genset rotate speed is over the upper limited. If the speed of gen-set comeback in normal state, the delay will be interrupt. If the speed still over limit when delay ended, It will be a " over speed" alarm.
Delay of high oil temp./low fuel level	Similar to the delay of " low oil pressure"
Delay of "loss speed"	If not detect the speed signal in the term of starting or running, the delay of "lose speed" is begin. If no yet detect the speed signal, when the delay is over, that will appear the alarm of "lose speed".
Delay of "low battery "	Similar to the delay of "low oil pressure alarm".
Delay "transform"	When the normal supply comeback normal state after gen-set onload it's action. The normal supply must be stable for period of time, until the delay retransform is over that switch to normal supply on load.
Delay of " over current"	It is similar to the delay of "low oil pressure alarm".
Delay of "over voltage"	Similar to the delay of "low oil pressure alarm".
Delay of "over frequency"	Similar to the delay of "low oil pressure alarm".
Delay of "Dec.time"	Delay of Dec start when the genset stop,Deceleration relay closed,if the delay ended but still not get the Dec in the right position signal, it will be a "Dec failure" alarm.
Delay of "warm up"	Happenned during the time when the gen-set starting successfully. To extend the time of power supply swiching to genset on load. Power supply until the gen-set reach to optimal state if not emergency, and availably reduce the abrasion.

6. Normal failure and handling method

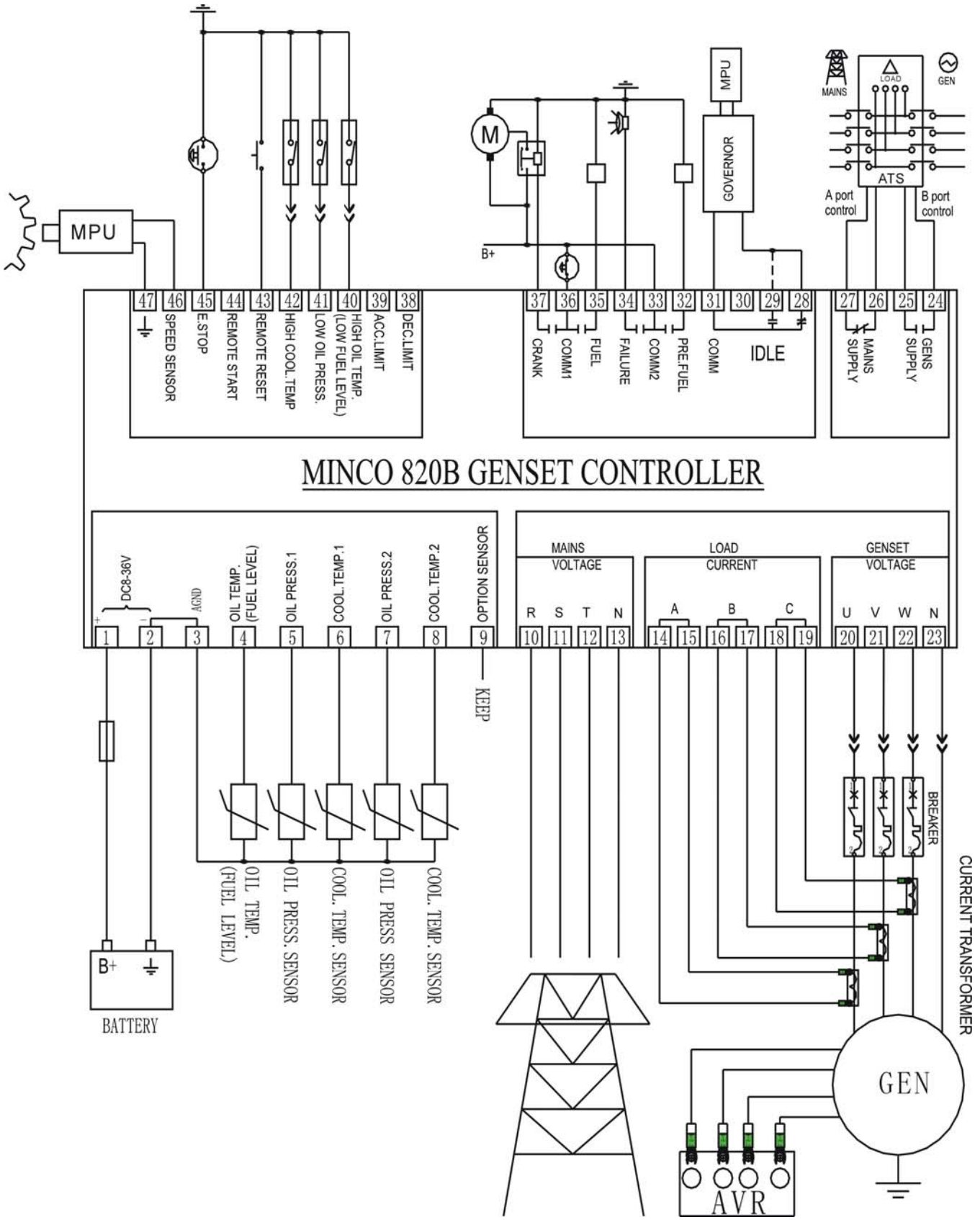
Failure	Describtion	Solution
Manual start failure	Press the **ENT** key，the green light isn't bright on the aboved and the motor doesn't work.	Check whether the greenlight is broken,if the LED light isn't broken,please contact with the factory;If the LED light is broken,please see below solution.
	Press the **ENT** key，the green light is bright on the aboved and the motor doesn't work.	Check the menu of"low oil pressure"in the "input port state",if display "0",please check whether the oil pressure sensor is ok;if display "1",the oil pressure sensor is ok,now please press **START**,measuring the module port 34 "start" whether there's 24V with a multimeter,if the voltage is 24V,check whether the outside middle relay,start moter is broken,and whether the battery voltage is enough;If port 34 no output,the module might be damaged.

Auto start failure	Module in **Auto** state,inspection “remote start” have input, the “remote start” state light isn’t bright and the motor doesn’t work.	Check the menu of “remote start” in the“input state”,if the “remote start” display “0” means that the outside timer etc module relay is broken cause didn’t receive the input signal;If display “1”,the module might be broken.
	Module in **Auto** state,inspection “remote start” have input, the “remote start” state light is bright on and the motor doesn’t work.	Check the oil pressure sensor; Switch to the manual start, check whether there’re output signal of the port 34-“remote start”, the outside components and the battery voltage.
Wheel tooth is fighting when start	Start successful and motor keep running, the whell tooth is fighting.	Lower down the trip speed; Suggest used speed sensor to get the rotate speed.
On load current display incorrect.	Current ratio setting incorrected.	Reset the current ratio.

7. Outside wire connection drawing



Minco820B Outside wire connection drawing(Mechanical speed control)



Minco820B Outside wire connection drawing (Electronic governor)

8. Front and back panel contrast diagram